**In the Claims:**

Please amend claims as follows, noting that this listing of claims will replace all prior versions and prior listings of claims in the application:

Listing of Claims:

1. (Withdrawn) An automatically scramming nuclear reactor system, comprising:

a core, said core having a coolant inlet end and a coolant outlet end;

a cooling system operatively associated with said core, said cooling system providing coolant to the coolant inlet end of said core and removing heated coolant from the coolant outlet end of said core, said cooling system maintaining a pressure differential between the coolant inlet end of said core and the coolant outlet end of said core during a normal operating condition of said nuclear reactor system;

a guide tube positioned adjacent said core, said guide tube having a first end and a second end, the first end of said guide tube being in fluid communication with the coolant inlet end of said core, the second end of said guide tube being in fluid communication with the coolant outlet end of said core; and

a control element positioned within said guide tube, said control element being movable within said guide tube between an upper position and a lower position, the control element automatically falling under the action of gravity to the lower position when the pressure differential drops below a safe pressure differential.

2. (Withdrawn) The nuclear reactor system of claim 1, wherein said control element

comprises a piston body, said piston body being closely received within said guide tube, said piston body being held above the lower position within said guide tube primarily by a static pressure component of the pressure differential.

3. (Withdrawn) The nuclear reactor system of claim 1, wherein said control element comprises an aerodynamic body, said aerodynamic body being loosely received within said guide tube, said aerodynamic body being lifted above the lower position within said guide tube primarily by a dynamic pressure component of a bypass flow of coolant in said guide tube.

4. (Currently Amended) A method for scramming a nuclear reactor system, comprising:

positioning a guide tube within a core of said nuclear reactor, said guide tube comprising:

an elongated inlet section having a proximal end and a distal end, the proximal end of the inlet section defining a first end of the guide tube, the first end of the guide tube being in fluid communication with a coolant inlet end of the core;

a substantially straight control element section extending generally upwardly through the core, the control element section having a proximal end and a distal end;

a first U-shaped section fluidically connecting the distal end of the inlet section and the proximal end of the control element section;

an elongated outlet section having a proximal end and a distal end, the distal end of the outlet section defining a second end of the guide tube, the second end of said guide tube being in fluid communication with a coolant outlet end of the core, the coolant outlet end of the core being located at a position below the coolant inlet end of the core; and

a second U-shaped section fluidically connecting the distal end of the control element section and the proximal end of the outlet section;

positioning a control element within the control element section of the guide tube, the control element being moveable within the control element section of the guide tube between an upper position and a lower position;

providing a coolant to ~~a~~ the coolant inlet end of the core ~~of said nuclear reactor system~~;

removing heated coolant from the coolant outlet end of the core ~~of said nuclear reactor system~~, said providing coolant and said removing ~~heating~~ heated coolant ~~establishing a flow of coolant through said nuclear reactor system, the flow of said coolant~~ creating a pressure differential across the control element section of the guide tube; and

using the pressure differential to hold the control element at about the upper position in the control element section of the guide tube, the control element automatically falling under the action of gravity to the lower position when the pressure differential drops below a safe pressure differential

~~providing a lift force during a normal operating condition of said nuclear reactor~~

~~system;~~

~~using the lift force provided by the flow of said coolant to hold a control element above a scramming position during the normal operating condition of said nuclear reactor system, the control element automatically falling under the action of gravity to the scramming position when said nuclear reactor system exceeds a safe operating temperature.~~

5. (Currently Amended) The method of claim 4, wherein using the ~~lift force~~ pressure differential to hold ~~a~~ the control element ~~above a scramming~~ at about the upper position comprises using primarily a static pressure component of the pressure differential to hold the control element ~~above the scramming~~ at about the upper position.

6. (Withdrawn) The method of claim 4, wherein using the lift force to hold a control element above a scramming position comprises using primarily a dynamic pressure component of a bypass flow of coolant to hold the control element above the scramming position.

7. (Original) The method of claim 4, wherein said step of providing a coolant comprises providing a coolant in a gas phase.